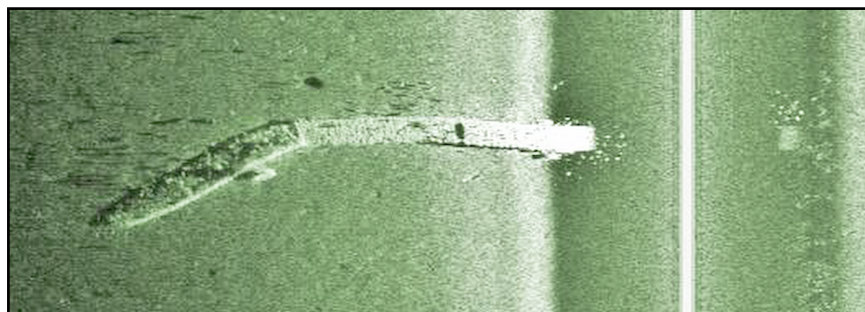
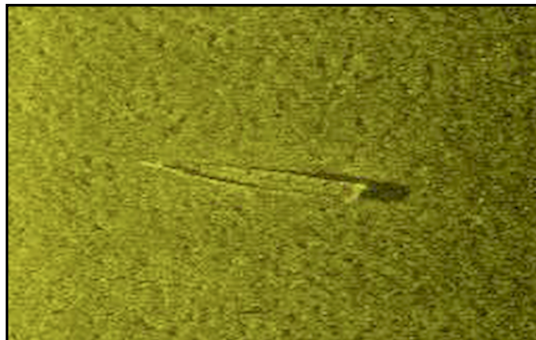


MARITIME HERITAGE MINNESOTA



Ann Merriman
Christopher Olson

Suburban Lakes Nautical Archaeology 2 Project Report: Prior Lake



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Acknowledgments

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Underwater Archaeologist
Christopher Olson



Underwater Archaeologist
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Volunteer Diver
Kelly Nehowig



Volunteer Diver
Mark Slick



Volunteer Diver
Ed Nelson



Volunteer Diver
Josh Knutson



Trustee
Steve Hack



Chair
Mike Kramer



Mascots & Computing Cats
Weebles Cat & Rodney Cat



Volunteer
Betty Lloyd



Volunteer Dive Crew
Ann Nehowig



Trustee
Deb Handschin



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MHM IS A 501.(c).3 NON-PROFIT CORPORATION DEDICATED TO THE DOCUMENTATION, CONSERVATION, AND PRESERVATION OF MINNESOTA'S FINITE MARITIME CULTURAL RESOURCES

“ACHF grants have allowed a small St. Paul-based nonprofit, Maritime Heritage Minnesota (MHM), to re-establish the discipline of underwater archaeology in Minnesota. Without this support, MHM could not have conducted its groundbreaking nautical archeological and maritime historical research.”

~Steve Elliott, Former Minnesota Historical Society CEO and Director, January 2015

Introduction

Wrecks and the artifacts associated with them tell a story. Removing or otherwise disturbing artifacts, treating them as commodities that can be sold, obliterates that story. Nautical archaeological and maritime sites are finite, and are significant submerged cultural resources. Nautical, maritime, underwater, maritime terrestrial – Maritime Heritage Minnesota's (MHM) deals with all of these types of sites throughout the State of Minnesota. MHM's Mission is to document, conserve, preserve, and when necessary, excavate these finite cultural resources where the welfare of the artifact is paramount. MHM is concerned with protecting our underwater and maritime sites – our shared Maritime History – for their own benefit in order for all Minnesotans to gain the knowledge that can be obtained through their study. MHM's study of wrecks does not include the removal of artifacts or damaging the sites in any way. MHM does not raise wrecks or 'hunt' for 'treasure'. Submerged archaeological sites in Minnesota are subject to the same State statutes as terrestrial sites: the Minnesota Field Archaeology Act (1963), Minnesota Historic Sites Act (1965), the Minnesota Historic District Act (1971), and the Minnesota Private Cemeteries Act (1976) if human remains are associated with a submerged site. Further, the case of *State v. Bollenbach* (1954) and the Federal Abandoned Shipwrecks Act of 1987 provide additional jurisdictional considerations when determining State oversight and "ownership" of resources defined by law as archaeological sites (Marken, Ollendorf, Nunnally, and Anfinson 1997, 3-4). Therefore, just like terrestrial archaeologists working for the State or with contract firms, underwater archaeologists are required to have the necessary education, appropriate credentials, and hold valid licenses from the Office of the State Archaeologist (OSA).



Respect the Diver Down Flag



Preface

In 2016, during the Minnesota Suburban Lakes Survey Project (MSLS), MHM surveyed Upper and Lower Prior Lake (1,238 acres, Scott County), Lake Pulaski (702 acres, Wright County), Medicine Lake (886 acres, Hennepin County), Lake Johanna (213 acres, Ramsey County), Lake Sylvia (1,524 acres, Wright County), and Lake Elmo (206 acres, Washington County). Other MHM sonar survey and underwater archaeology projects have taken place in Lake Minnetonka, White Bear Lake, Lake Waconia, the Headwaters Mississippi River, and the Minnesota River. In 2017, during the Minnesota Suburban Lakes Nautical Archaeology 1 Project (MSLNA-1), MHM investigated 14 anomalies in Prior Lake, 10 anomalies in Lake Pulaski, and 5 anomalies in Lake Waconia in Carver County in order to answer specific questions about their natures. After the completion of the MSLNA-1 Project fieldwork, there is now 1 identified wreck on the bottom of Lake Waconia, 7 wrecks and 1 object in Lake Pulaski, and 3 wrecks, 3 maritime sites or objects, and 2 'other' site types on the bottom of Prior Lake. The anomalies were identified through underwater archaeological reconnaissance fieldwork using SCUBA, digital video, measured drawings, and maritime historical research. Of these 11 wrecks, 3 of them now have Minnesota archaeological site numbers.

Results of the Minnesota Suburban Lakes Nautical Archaeology 2 Project

Research Design

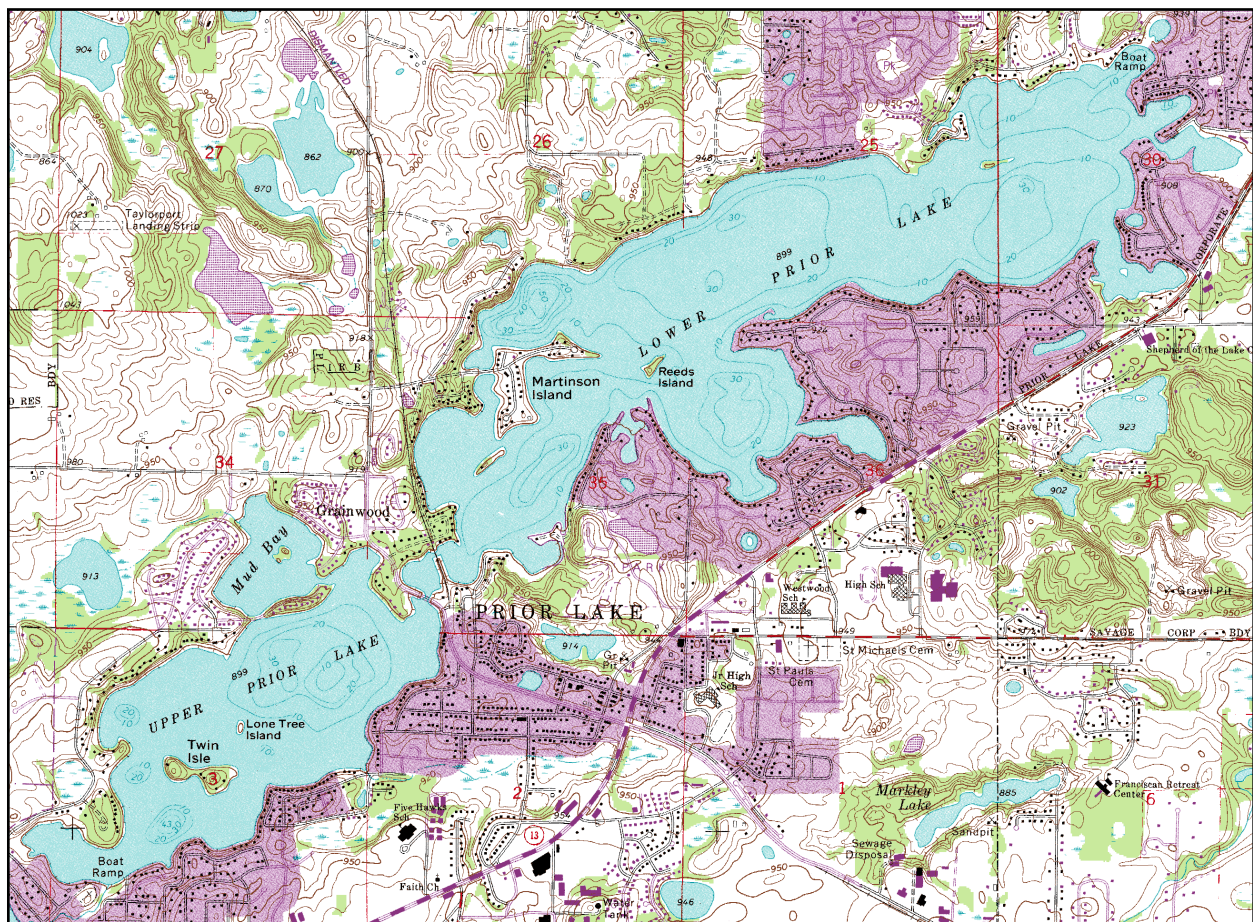
The purposes of the MSLNA-2 Project was to conduct targeted and comprehensive remote sensing sonar surveys using new and improved sonar equipment; and use underwater archaeological reconnaissance to answer questions about and determine the nature of specific anomalies. The lakes focused on during the project are Prior Lake, Lake Pulaski, Medicine Lake, and Lake Johanna. The targeted sonar scanning undertaken in Prior Lake and the comprehensive scanning undertaken in Lake Pulaski, Medicine Lake, and Lake Johanna greatly assisted MHM during data review; dozens of anomalies were identified as wrecks, objects, or false targets using only their acoustical signatures.

Methodology

The use of improved sonar equipment to record images with increased detail and clarity directly affected underwater archaeological reconnaissance by facilitating efficient dive planning. Specifically, it eliminated the need to dive on dozens of anomalies that turned out to be false targets - unusual bottom contours, rocks, and trees. Further, MHM can identify maritime sites such as docks, boat lifts, dock canopies, and steam boilers to determine if dive reconnaissance on those objects is necessary, depending on their location and other factors. For the MSLNA-2 Project, dozens of anomalies in the 4 lakes were identified as false targets - determined by their acoustical signature and comparisons with previously recorded sonar data - without diving on them. In addition, the new equipment allowed MHM to record detailed acoustical signatures of known wrecks and other sites to further our knowledge about them; this ability is particularly useful in low visibility waters. Using data accumulated from the fieldwork as a starting point, MHM conducted research to place newly recognized nautical archaeological sites

Results

After the completion of the MSLNA-2 Project fieldwork in late October 2018, there are now 9 identified wrecks, 1 maritime site, 3 objects, and 2 possible wrecks in Lake Pulaski; 3 identified wrecks, 1 unidentified wreck, 3 possible wrecks, 5 possible maritime sites, 3 'other' objects, and a series of barrels and poles on the bottom of Medicine Lake; 2 wrecks, 4 maritime sites, 2 'other' objects, and 6 possible wrecks in Lake Johanna; and 3 identified wrecks, 1 unidentified wreck, 5 possible wrecks, 9 maritime sites, and 6 other sites or objects on the bottom of Prior Lake. Some of the sites and objects have not been dove upon yet, but may be investigated using SCUBA in the future. The anomalies were identified through underwater archaeological reconnaissance fieldwork using SCUBA, digital video, measured drawings, improved side and down-imaging sonar, and maritime historical research. Of the 17 identified wrecks in these 4 lakes, 7 of them now have Minnesota archaeological site numbers. During the MSLNA-2 Project specifically – MHM and its volunteers identified 7 new wrecks, 11 new submerged maritime sites, 8 'other' objects, and confirmed the existence of 2 other wrecks using sonar.



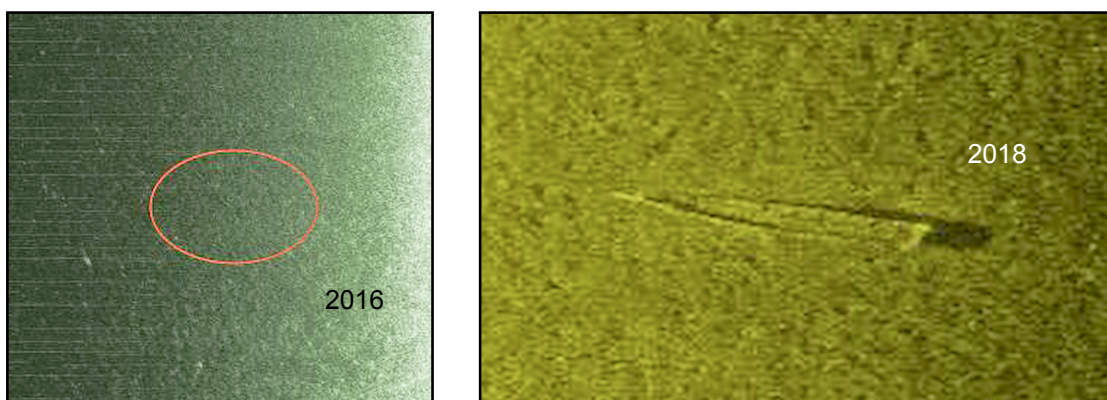
Upper and Lower Prior Lake (USGS)

Prior Lake Project Results

During the MSLNA-2 Project, MHM's targeted side and down imaging sonar re-scanning of Prior Lake using updated sonar equipment allowed for the identification of 25 anomalies as false targets comprised of bottom contours or vegetation (A2, A9, A14, A15, A17, A19, A20, A22, A27.1-3, A29, A31, A32, A42-A44, A46, A48-A50, A53, A54), rocks (A8, A12, A15a-b, A19, A20, A24, A29, A31) and trees (A52, A55) - without dive reconnaissance. Further, A3 - identified in 2017 as a lake bottom contour - is actually a tree and A47 is the same tree; the data discrepancy as reflected in the different coordinates of A3 and A47 can happen because of GPS error. Anomaly 55's V-shaped sonar signature suggested it was a wreck; it is part of a tree. Further, several anomalies have been identified as a wreck (A57), possible wrecks (A58, A59, A63, A64), maritime sites (A1, A4, A8.1, A28.1-A28.2, A30, A41, A54, A61, A62) and 'other' sites (A5, A8.2, A56, A56.1-A56.5, A60, A65).

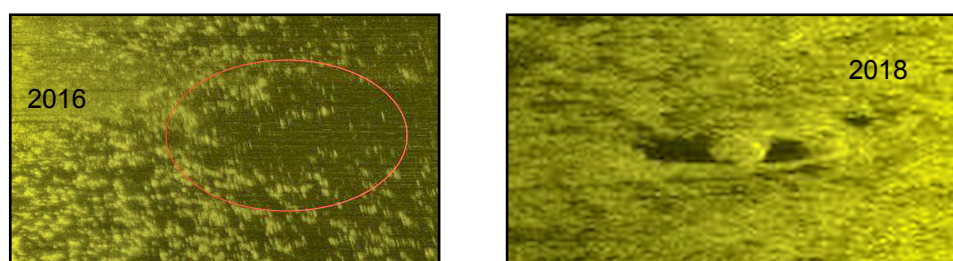
Small Wreck (Anomaly 57)

MHM recorded a sonar image of Anomaly 57 during the 2016 survey but the acoustical signature did not stand out in the recording. The 2018 image of Anomaly 57 clearly shows it is a small wreck. MHM will plan SCUBA reconnaissance to determine the wreck's construction attributes and then research her history.



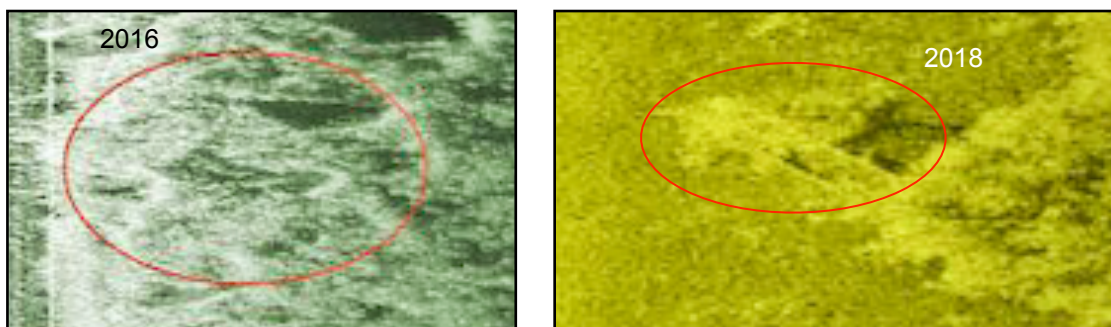
Possible Wreck (Anomaly 58)

In 2016 MHM recorded sonar footage of the area where Anomaly 58 is located among thick weeds and it was shadowed. In 2018, MHM approached the area from a different direction and produced an acoustical signature that suggests A58 might be a wreck. The anomaly is approximately 11.00 feet long. Dive reconnaissance will be necessary to determine the nature of the anomaly.



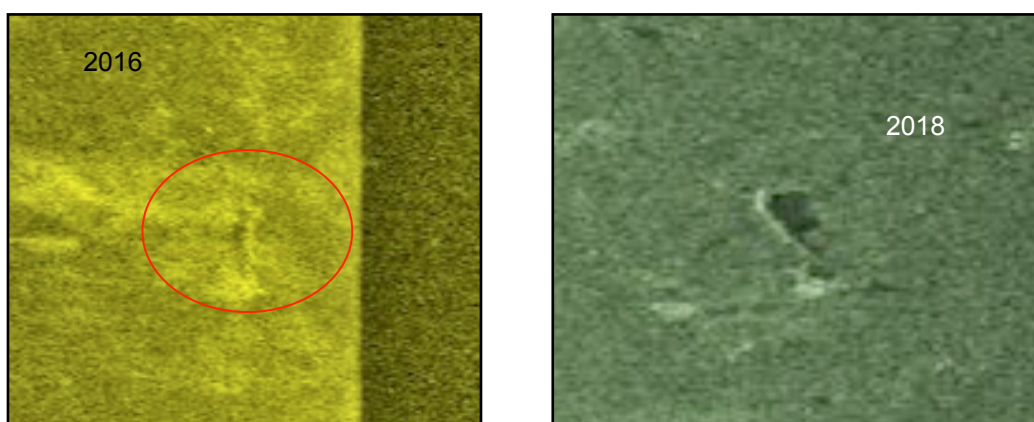
Possible Wreck (Anomaly 59)

MHM recorded sonar footage of Anomaly 59 located among thick weeds in 2016. In 2018, the weeds had partially cleared and revealed 2 parallel lines between 2 weed clumps. The object may be a small wreck, other maritime site, or natural object such as a tree or trees and is approximately 15.00 feet long. Dive reconnaissance will be necessary to determine the nature of the anomaly.



Possible Wreck (Anomaly 64)

MHM recorded sonar footage of Anomaly 64 in 2016 but it was indistinct and not recognized as a cultural resource. During the MSLNA-2 Project, a sonar signature with increased clarity was recorded. The anomaly is partially buried but the exposed section suggests it is a small wreck with a deck and a cockpit; it is approximately 12.00 feet long. Dive reconnaissance will be necessary to determine the nature of the anomaly.



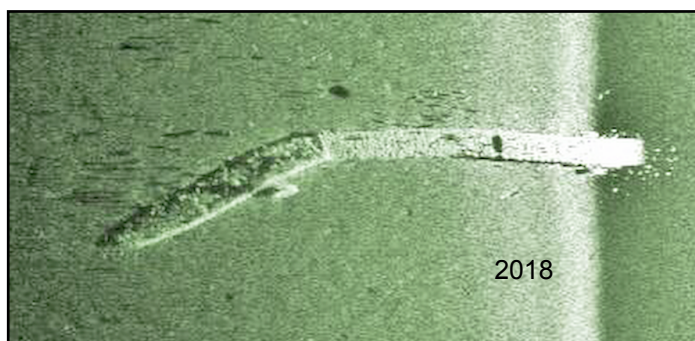
Possible Small Wreck (Anomaly 63)

MHM recorded sonar footage of Anomaly 63 in 2016 but it was indistinct and not recognized as a cultural resource. In 2018, a sonar signature with increased clarity was recorded and although it is not conclusive, it may be a small wreck or cultural resource. The anomaly is approximately 10.00 feet long and dive reconnaissance will be necessary to determine its nature.



Large Dock (Anomaly 54)

MHM recorded Anomaly 54 in 3 different passes during the 2016 sonar survey but it did not appear to be a large object. Anomaly 54 is a large dock, approximately 42.00 feet long and 4.00 feet wide. It is lying broken in 2 pieces on the bottom of the lake near an island. Anomaly 54 is a submerged maritime cultural resource and may be investigated using SCUBA in the future.



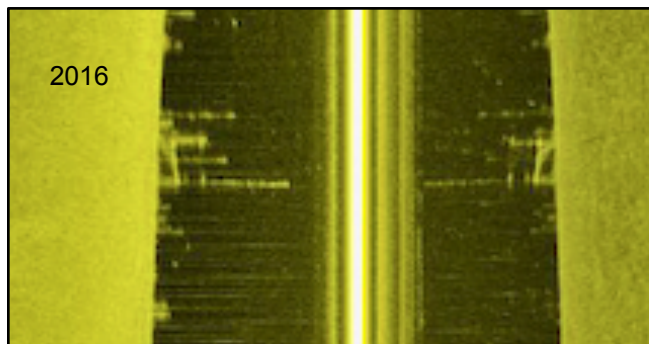
Dock Section (Anomaly 62)

MHM recorded the area where Anomaly 62 is located but it was not recognized as a cultural resource. The 2018 image of the anomaly is detailed and it is clear that it is a Dock Section, 8.00 feet long by 4.00 feet wide. MHM suggests Anomaly 62 is part of a movable dock system nearby. While the Dock Section could be investigated by SCUBA in the future, doing so would only be done to answer archaeological questions about it.



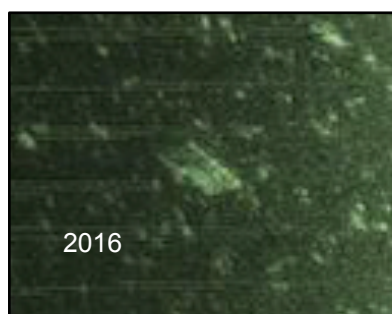
Boat Lift (Anomaly 41)

In 2016, MHM passed directly over Anomaly 41 and determined it was a Boat Lift. In 2018, another recording of the anomaly using the improved sonar suggests that it is probably upside down. There is no canopy associated with the Boat Lift, and there is no lift wheel evident; it is approximately 10.00 feet long and 6.00 feet wide.. While the Boat Lift could be investigated by SCUBA in the future, doing so would only be done to answer archaeological questions about it.



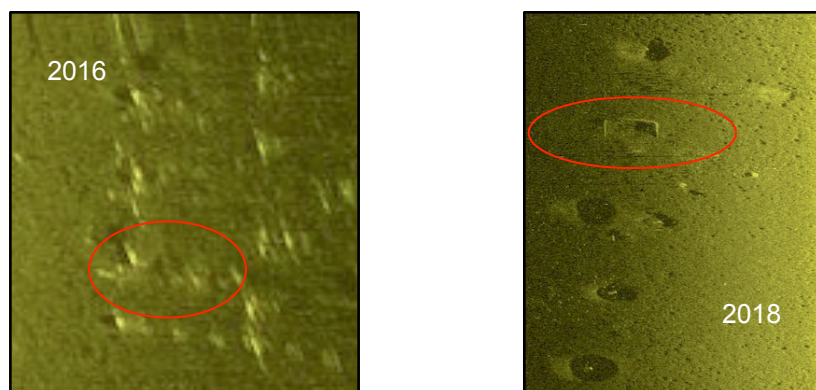
Canopy Frame and Supports (Anomaly 4)

MHM recorded a recognizable sonar image of Anomaly 4 in 2016 and a clearer image of the Canopy Frame and Supports in 2018. Anomaly 4 is approximately 13.00 feet long and 6.00 feet wide. MHM will not be investigating it using SCUBA. Further, due to the identification of the anomaly as a canopy frame, investigation of the object will not answer any significant questions pertaining to the anomaly's nature.



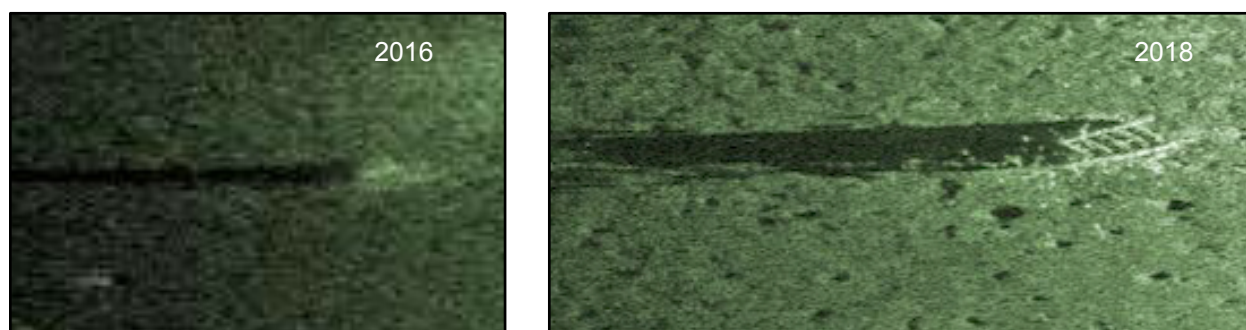
Canopy Frame (Anomaly 61)

MHM recorded a sonar image of Anomaly 61 in 2016; however, it was indistinguishable from the removable dock that surrounds it during the summer months. In 2018, the dock had been removed from the lake when MHM scanned the area, revealing the Canopy Frame among the scars created by the dock supports on the lake bottom. Anomaly 61 is approximately 10.00 feet long and is partially buried. Anomaly 61 is a submerged maritime cultural resource but because of its location, MHM will not be investigating it using SCUBA. Further, due to the identification of the anomaly as a canopy frame, investigation of the object will not answer any significant questions pertaining to the anomaly's nature.



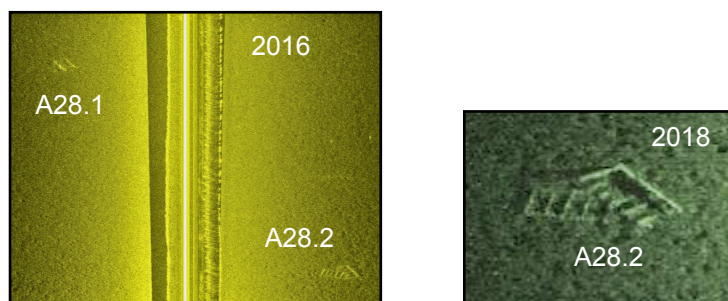
Canopy Frame (Anomaly 8.1)

MHM recorded a sonar image of Anomaly 8.1 in 2016; it cast a significant acoustical shadow but without enough detail to enable its identification. MHM's 2018 sonar data makes it clear that Anomaly 8.1 is a Canopy Frame that is approximately 10.00 feet long and 6.00 feet long. Anomaly 8.1 is a submerged maritime cultural resource, but investigation of the object using SCUBA is unlikely unless it can be determined fieldwork will significant questions pertaining to the anomaly's nature.



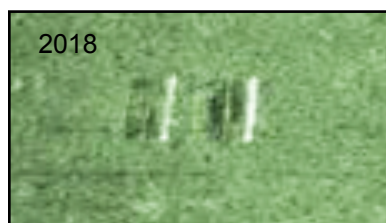
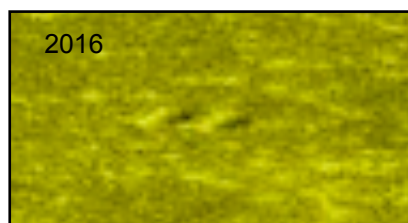
Canopy Frame and Supports (Anomalies 28.1, 28.2)

MHM recorded sonar images of Anomalies 28.1 and 28.2 in 2016; they lie 175 feet from each other. More detailed images recorded during the MSLNA-2 Project suggest they may be parts of a Supports and Canopy Frame unit. The 2016 sonar data of A28.1 is a down image and it suggests a rectangular object. The 2018 re-scanning confirms A28.1 is actually 2 rectangular objects that appear to be sections of a Canopy Frame. Anomaly 28.2 appears to be a Boat Lift - and these objects may belong together. Anomalies 28.1 and 28.2 are submerged maritime cultural resources that may be identified using SCUBA reconnaissance in the future.



Capsized Pontoon Raft (Anomaly 1)

MHM recorded sonar images of Anomaly 1 in 2016 and 2018. Initially MHM supposed it was an Capsized Pontoon Raft and the MSLNA-2 sonar recording supported this identification. The bottom of the raft is approximately 4.00 feet wide and 7 feet long. However, Anomaly 1 may be a capsized pontoon boat instead of a raft; either way, it is a submerged maritime cultural resource that may be positively identified using SCUBA reconnaissance in the future.



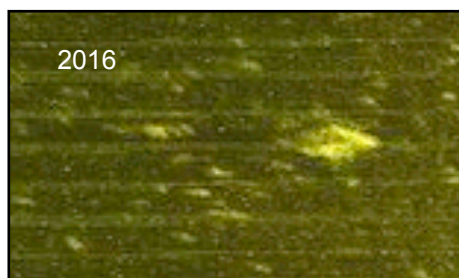
Possible Dock Box or Fish House (Anomaly 8.2)

MHM recorded a sonar image of Anomaly 8.2 in 2016. It appeared to be an object with an irregular shape and while it did cast a significant acoustical shadow, it did not have enough detail to enable its identification. MHM's 2018 sonar data makes it clear that Anomaly 8.2 is rectangular in shape with sharp edges and it is partially buried. It's shape suggests it is a Dock Box or possibly a Fish House. Anomaly 8.2 is a submerged maritime cultural resource that may be identified using SCUBA reconnaissance in the future.



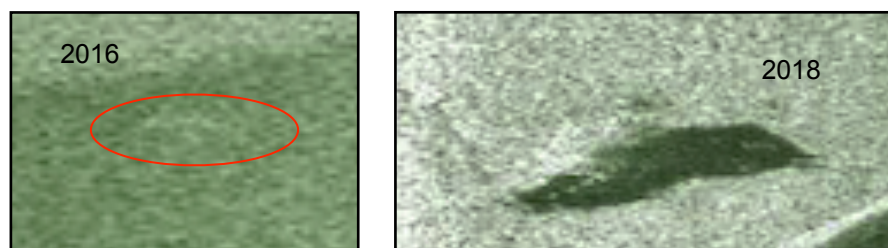
Possible Fish House (Anomaly 30)

MHM recorded sonar images of Anomaly 30 in 2016 that suggests a square object. However, a 2018 image of the anomaly indicates it is rectangular - possibly a fish house. It measures approximately 8.00 feet wide and 11.00 feet in height. Anomaly 30 is a submerged maritime cultural resource that may be identified using SCUBA reconnaissance in the future.



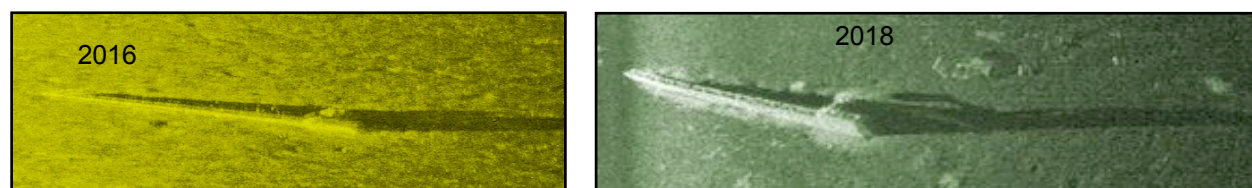
Possible Snowmobile (Anomaly 65)

MHM recorded a sonar image of Anomaly 65 in 2016 that was ambiguous and the 2018 data suggests it may be a snowmobile. The anomaly measures approximately 9.00 feet long. Anomaly 65 may be identified using SCUBA reconnaissance in the future.



Power Pole, Telephone Pole, or Railroad Signal Light (Anomaly 5)

MHM recognized Anomaly 5 in 2016 as a Power Pole, Telephone Pole, or Railroad Signal Light and re-scanned it in 2018. Surveys during both years produced detailed acoustical signatures of the pole, but the most recent images include more details. The anomaly is located next to an abandoned railroad right-of-way. MHM will not dive on Anomaly 5 unless some questions arise about it that can only be answered through underwater archaeological reconnaissance.



V-Shaped Object (Anomaly 56)

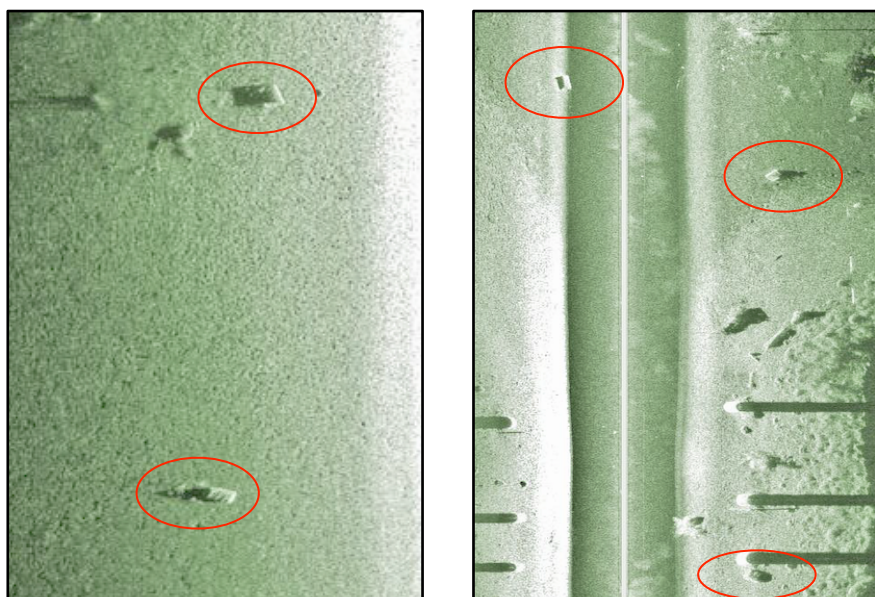
MHM did not recognize Anomaly 56 in 2016 because the area was covered in vegetation. During the MSLNA-2 Project, Anomaly 56 was recognized as a small V-shaped object with a significant acoustical shadow. MHM cannot identify it without SCUBA reconnaissance and this may occur in the future.



Barrels (Anomaly 56.1-56.5)

In 2018, MHM recorded sonar images of several objects spread out over a 250-foot area. Many of the objects are rocks but 5 of them are 3.00-foot tall Barrels. The 2016 acoustical signatures of the Barrels were lacking details; however, the new sonar unit

produced images that allowed MHM to determine they are barrels. Specifically, the differentiation of the 3 barrel sections can be discerned in the sonar footage. The reason or reasons behind the disposition of the barrels on the lake bottom cannot be determined. However, they may have formed part of a recreational raft, older pontoons, or they may have been dumped into the lake separately or in any combination. Anomaly 28.2 appears to be a Boat Lift - and these objects may belong together. Anomaly 56.1-56.5 is a submerged maritime cultural resource that does not require SCUBA reconnaissance investigations in the future.



Conclusion

MHM identified the only 3 recognized wrecks on the bottom of Prior Lake during the MSLNA-1 Project in 2017: the Wooden Outboard Wreck (21-SC-108), the Fiberglass Hydroplane Wreck (21-SC-109), and the Glasspar G-3 Skiboat Wreck (Anomaly 18). MHM's targeted re-scanning of Prior Lake using improved down and side-imaging sonar during the MSLNA-2 Project produced significantly more detailed data. Within this data, MHM recognized a 4th wreck (Anomaly 57) and 4 possible wrecks (Anomalies 58, 59, 63, 64). It is archaeologically necessary to investigate these anomalies using SCUBA to determine their nature and rudimentarily document them if warranted. Anomaly 1 is a maritime site comprised of 2 pontoons; dive reconnaissance on this site is essential to determine whether it is a capsized raft or boat. Two other potential maritime sites - the possible Fish House/Dock Box (Anomalies 8.2) and Fish House (Anomaly 30) will also require SCUBA reconnaissance to determine their natures. If one or both of these anomalies is a Fish House, it is a piece of material culture that represents a significant activity for a large number of Minnesotans. Another maritime site that also represents Minnesota transportation is the possible Snowmobile site; diving is required on Anomaly 65 to determine its nature. Some maritime sites identified in 2016 and through new sonar footage in Prior Lake during the MSLNA-2 Project have sufficient detail that diving on them will not be necessary in the future. Those anomalies include the Large Dock (Anomaly 54), Dock Section (Anomaly 63), and the different combinations of boat lifts, canopies, and frames (Anomalies 41, 4, 6, 8.1, 28.1, 28.2). These maritime resources

are expected to be found on the bottom of Minnesota's lakes because of their use as shoreline infrastructure that are often susceptible to high winds. Also, MHM does not plan on conducting dive reconnaissance on the Power Pole (Anomaly 5), Barrels (Anomaly 56.1-56.5), or the V-Shaped Object (Anomaly 56); if a day's dive plan and tank air could accommodate a quick drop onto these objects, MHM would consider some data collection. Therefore, one more season of fieldwork will allow MHM to determine the nature of the new wreck (Anomaly 57), possible wrecks (Anomalies 1, 58, 59, 63, 64), and the other possible maritime/transportation sites (Anomalies 8.2 30, 65) in 2-3 days of fieldwork in order to increase the collective maritime archaeological and historical knowledge of Minnesotans.

As a whole, the MSLNA-2 Project produced interesting and significant results investigating 14 anomalies in 4 lakes in 4 counties using SCUBA. MHM dove upon and identified 7 wrecks, recognized an additional 2 wrecks in sonar data that will be targeted during future research, 14 possible wrecks, 11 maritime sites or objects, and 8 'other' objects in Prior Lake, Lake Pulaski, Medicine Lake, and Lake Johanna. Of the 7 wrecks, MHM acquired Minnesota Archaeological Site Numbers for 5 of them: 1 in Lake Pulaski, 3 in Medicine Lake, 1 in Lake Johanna. The wrecks in Medicine Lake and Lake Johanna are the first underwater archaeological sites identified in these lakes.

The wrecking processes responsible for the creation of Minnesota's submerged cultural resources have produced a variety of underwater sites. Identifying, comparing, and associating these new sites in Lake Johanna, Medicine Lake, Lake Pulaski, and Prior Lake with known sites increases our understanding of the historical context within which these cultural resources operated or were exploited by Minnesotans. Future studies will greatly enhance our shared maritime history through the recognition of submerged cultural resources and the stories behind their construction and disposition. The diversity of nautical, maritime, and underwater sites so far identified by MHM in Minnesota's lakes are tangible examples of the rich maritime history of the area. Through research, diving on wrecks and anomalies to collect pertinent data, and ensuring that the collected information is accessible by the public, MHM will continue to investigate Minnesota's submerged cultural resources into the future. MHM continues to re-examine recorded sonar footage from completed remote sensing surveys. Targeted re-scanning has occurred in several lakes using knowledge gained from the comparison of anomalies that have proven to be wrecks or other submerged cultural resources in past projects. With improved technology, future scanning projects will produce clearer data. The results of the MSLNA-2 Project summarized above is connected to all the work that came before and will come after its completion. At this point, watercraft located Minnesota's suburban lakes represent approximately 1,000 years of Minnesota's maritime history and nautical archaeology. In the historic period, the known wrecks represented in these lakes span around 120 years of local maritime culture. It is clear – even through this Phase 1 pre-disturbance nautical archaeological investigation – that the types of sites that exist in Minnesota's suburban lakes documented to date are diverse, archaeologically and historically significant, and worthy of great attention.

Reference

Marken, M.W., A. Ollendorf, P. Nunnally, and S. Anfinson. 1997. *Beneath Minnesota Waters: Minnesota's Submerged Cultural Resources Preservation Plan*. Summit Envirosolutions, Inc. and Braun Intertec, St. Paul. Report prepared for the State Historic Preservation Office, Minnesota Historical Society: St. Paul, MN.